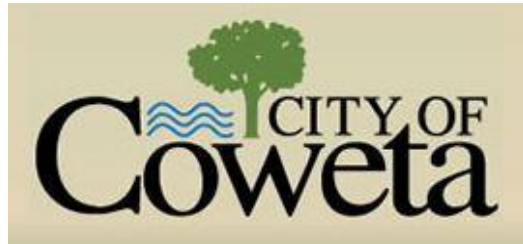


Coweta Sidewalk Master Plan Report

Oklahoma SRTS Project: "Operation Get There"



Prepared by: Lee Engineering, LLC

DRAFT

February 2012



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1. Background

The Coweta Sidewalk Master Plan project is a result of the Oklahoma Safe Routes to School (SRTS) Program which is administered by the Oklahoma Department of Transportation. The City of Coweta competitively bid to obtain funding to establish a project to identify and prioritize sidewalk needs in their community to serve the school children in grades K – 8, which are those grades eligible for funding under the Federal SRTS legislation. The Coweta Sidewalk Master Plan project was approved based on an application that was submitted to ODOT in October 2009 by the City of Coweta as project sponsor, entitled as “Operation Get There”. The Travel Plan for the City of Coweta SRTS Application was submitted in May 2009. The application and travel plan was a collaborative effort between the City of Coweta and the Coweta Independent School District officials, as well as representatives from the community.

The Oklahoma Department of Transportation website¹ provides the following SRTS program information:

The Safe Routes to School Program is a 100% federally funded reimbursement program established by the August 2005 SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users Act) Transportation Bill. The legislation provides funding (for the first time) for State Departments of Transportation to create and administer SRTS programs which allows communities to compete for funding for local safety projects and educational initiatives. SRTS is funded at \$612 million and provides Federal-aid highway funds to State Departments of Transportation (DOTs) over five Federal fiscal years (FY2005-2009), each State's share is based in accordance with a formula specified in the legislation. These funds are available for infrastructure and non-infrastructure projects, and for the administration of the State Safe Routes to School programs that benefit elementary and middle school children in grades K-8.

The intent of the program is:

- To enable and encourage children, including those with disabilities, to walk and bicycle to school.*
- To make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age.*
- To facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.*

¹ Oklahoma DOT, SRTS Website: <http://www.okladot.state.ok.us/srts/about.htm>, accessed January 18, 2012

The Federal-aid SRTS Program is administered by the Federal Highway Administration (FHWA) Office of Safety.

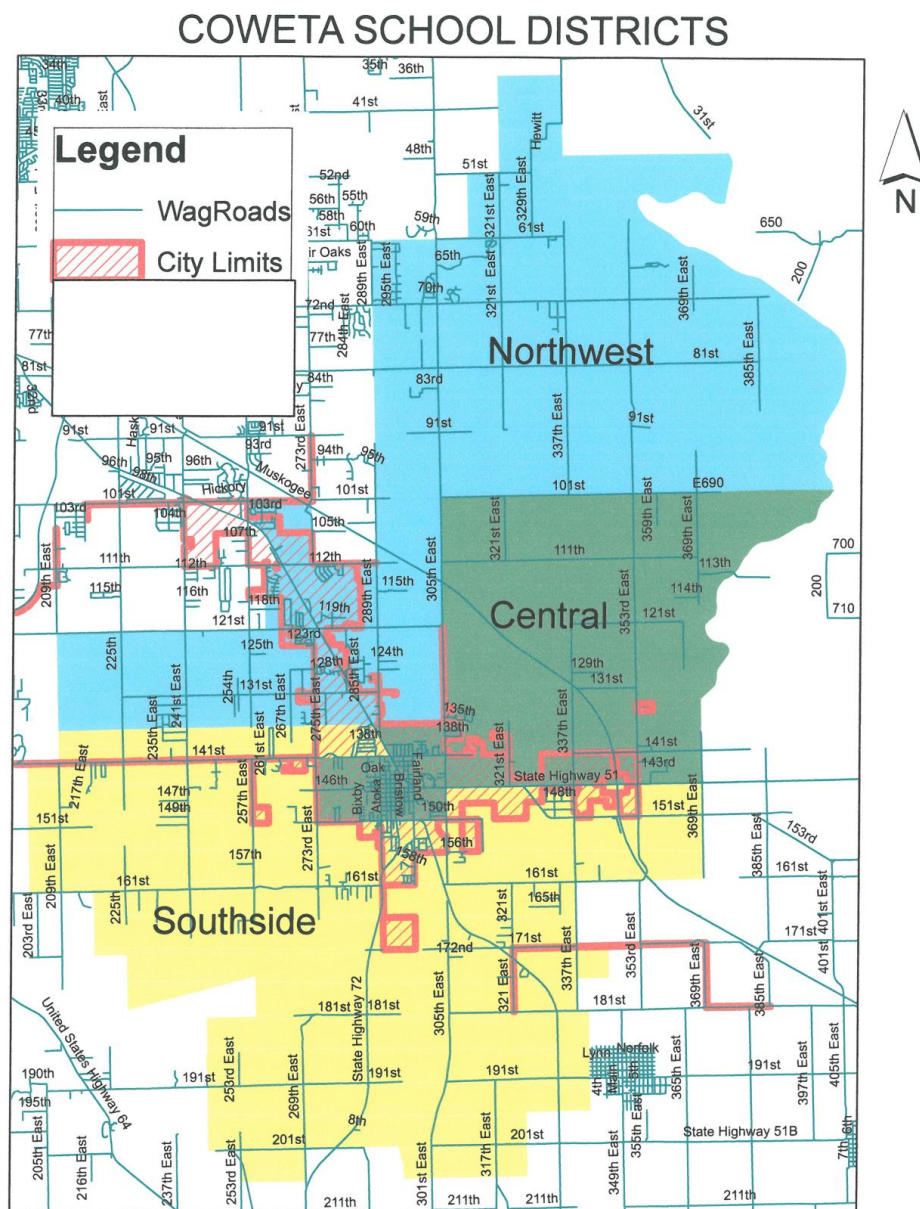
The SRTS Program encourages more walking and bicycling through a comprehensive program of Engineering, Education, Encouragement, Enforcement, as well as Evaluation so a community can measure the success of its program and make changes if needed. Engineering is needed to provide suitable walking routes to school and safe street crossings. Engineering is an essential part of the SRTS program because children will not walk if they do not have a safe and continuous pathway to do so. However, Engineering alone will not always change behavior. Thus, any successful SRTS program applies a combination was all five E's to improve walking conditions/safety; educate students and parents about the many benefits of walking and bicycling and ensure students are doing so safely; encourage more students to walk and the parents to allow their children to walk; and provide enforcement to improve safety along the walking paths and sidewalks around the school.

A June 28, 2011 strategic plan meeting was held between a representative of Lee Engineering, LLC and the Coweta SRTS Team members to review the application and establish a course of action for the Master Plan Project and the non-infrastructure portion of the plan involving the Education, Encouragement, Enforcement and Evaluation strategies required for a comprehensive SRTS plan. The following six Coweta schools were identified that would benefit from the SRTS program implementation:

Central Elementary School - 918-486-2130
303 N. Broadway Street
Coweta, OK 74429
Northwest Elementary School - 918-486-6559
26945 E. 131st Street
Coweta, OK 74429
Southside Elementary School - 918-279-0480
15297 S. Hwy 72
Coweta, OK 74429
Heritage Intermediate Grade Center - 918- 486-8590
15286 S. 297th E. Avenue
Coweta, OK 74429
Mission Intermediate Grade Center - 918-486-2186
30123 E. 147th Street (E Pecan Street)
Coweta, OK 74429
Coweta Junior High School - 918-486-2127
30080 E. Hwy 51
Coweta, OK 74429

There are six schools in the Coweta Public School District that serve students in grades K through 8 (plus two schools that serve grades 9 through 12). While there is some

regional breakdown of schools, the elementary schools serve grades Pre-K through 3, the intermediate grade centers serve grades 4 through 6, and the junior high school serves grades 7 and 8.



Coweta District elementary school attendance boundaries

There are relatively few sidewalks in the community and most neighborhood streets are rather narrow. There is also a BNSF railroad track that is somewhat diagonally located through the center of Coweta from the northwest to the southeast, and some of the children attending two schools have to walk across the tracks to access the schools. Prior to the start of this project, there were no established walking attendance boundaries for the schools because very little of the community is considered

pedestrian-friendly, especially for young school children. Thus, most of the students qualify for “hazard busing” or were driven to school by parents.

During a June 28, 2011 strategic plan meeting with community officials, there was a reluctance on behalf of the school district representative to conduct or promote encouragement programs because it was thought that most of the areas around the elementary, IGC and junior high schools were not sufficiently pedestrian-friendly. It was also learned that the Coweta police formerly conducted bicycle training for students, but lost their budget to do so. However, one School Resource Officer (SRO) is shared between all eight Coweta schools that may be used for this service and other enforcement activities. Regardless, there were several action items identified for school and city officials to consider and/or implement for the SRTS non-infrastructure program.

The notice to proceed from the Oklahoma Department of Transportation to Lee Engineering LLC for the Coweta Sidewalk Master Plan project was issued August 31, 2011 as SRA #1032. The contract between the City of Coweta and Lee Engineering, LLC was signed by the City Manager on September 12, 2011.

Terms and definitions, largely taken from the Oklahoma State Statutes, and used in this report, are provided in Appendix A



2. Introduction

Walking and bicycling is important for a person's health and is a basic form of transportation, especially for children. Studies have shown that there are many benefits to walking and bicycling including a greater ability for students to be more attentive in class, and improves a child's sense of well-being. Walking, instead of being transported in a vehicle, reduces vehicle emissions, eliminates traffic congestion and improves traffic safety, as well as promotes a sense of freedom and responsibility in a child.

Walking and bicycling has significantly declined for school children in recent decades across the US. Part of that problem is a change in social norms. Another problem is the lack of the infrastructure (sidewalks and safe street crossings) to facilitate children walking to and from school that would encourage parents to allow their children to walk and bike to school. Sidewalks are the "highways" for pedestrians. Without continuous sidewalks that provide a safe way for students to walk or bicycle to school, many children will not walk. Typically transportation is provided in the form of bussing or parents who drive their children to school. Often times, parents driving children to school can represent 25% or more of the traffic during the morning peak hour, and the extra traffic at the schools creates more traffic issues for those students who chose to walk or ride their bicycles.

The provision of adequate sidewalks allows for a safer walking environment for children. Coweta was built and developed with few sidewalks within the community. Many of the sidewalks that do exist are in outlying new subdivision or are along Broadway Street/Highway 72 that serves the Central Business District of Coweta. Other paved sidewalks also exist in portions of central Coweta, but few sidewalks provide a continuous walking path for children that walk to school.

The City of Coweta applied for Safe Routes to School funding to create a Sidewalk Master Plan for the identification and prioritization of sidewalk needs. This will allow city and school officials to request funding through the SRTS program or other funding sources and direct the infrastructure funds to where it can provide the best.

Sidewalk Design

The American Association of State Transportation Officials (AASHTO) Pedestrian Design Guide² recommends sidewalks that are five feet wide or wider, and they also recommend a buffer between the sidewalk and roadway. While four feet with is the absolute minimum sidewalk width, a five-foot wide sidewalk allows for pedestrians to walk side-by-side, and provides the needed room for wheelchair pedestrians

² Guide for the Planning, Design, and Operation of Pedestrian Facilities, AASHTO, Washington, DC, Publication Number GPF-1, July 2004

approaching in opposite directions to maneuver past each other. Wider sidewalks of eight to ten feet are desirable adjacent to schools and along arterial streets with higher speed traffic. It is best to provide a buffer or separation between the walkway and street to better separate pedestrian and motor vehicle traffic. Along local or collector streets, desirable sidewalk buffers are two to four feet wide. Along arterial streets, desirable buffers are five to six feet wide.



New sidewalk in Coweta with tactile warning strip required by ADA

At the October 5, 2011 Sidewalk Master Plan Kick-off meeting, it was decided that the cost estimates for sidewalks in Coweta would be based on a five-foot width for sidewalks along local and collector streets, and a six-foot width for sidewalks along arterial streets. Buffer would have no effect on the sidewalk cost estimates developed for this project. Furthermore, it is assumed there is sufficient right of way available to build the desired sidewalk width and buffer along the streets in Coweta. This issue may have to be addressed at the time of application for a SRTS infrastructure program since SRTS funds cannot be used to purchase right of way. Any needed right-of-way must have already been provided prior to applying for SRTS infrastructure funds.

There are a number of other issues that should be considered in sidewalk design and construction that are not addressed in this study, including side-slope, grades and ramps, curb cut design and other features to address accessibility, lighting, driveway crossings, obstacles in or near the sidewalks (street furniture, utility poles, sign posts, fire hydrants, etc.) railings for bridges, and sidewalk maintenance.



Existing sidewalk along Central Elementary School

3. Development of School Walking Maps

One of the initial activities undertaken in the Sidewalk Master Plan process was to create walking route maps for each of the six eligible schools (elementary, IGC and junior high school). This process was important to identify the walking attendance boundary for each school, the street/sidewalk segments that were being used by children attending each school, as well as the optimal walking routes for each school. Segments should have a higher priority for sidewalk construction not only if they are located adjacent to or near a school, but additional emphasis is also needed if the segment is on a primary walking route that serves a school. Some sidewalk segments serve multiple schools in the same area, and are given higher weight in the ranking process. These higher priority sidewalk segments that serve one or more school were identified through the development of walking route maps for each school. Those street segments that may be within a school walking attendance boundary, but are NOT used by students for walking to school are not given any extra weighting in the ranking process.

The kick-off meeting for the Coweta School Walking Map development program occurred on October 5, 2011, at Coweta City Hall. In addition to the City representatives, Kathleen Easley and Tim Young, there was at least one representative from each eligible school at the meeting to receive training on how to assess the walking areas for their schools. Assessment team members were also instructed to identify “problem” areas or challenges in the walking area as well as to identify the optimal walking routes for their schools. Each school assessment team was provided School Walking Route Plan Guidelines (Appendix B), a sample walking route map from another jurisdiction, and an example assessment tool to help the team members identify those items that have an impact on walkability and bikeability within the walking boundaries for each school.

After providing instructions on how to conduct a walking and bicycling assessment for schools and providing instructions on what was expected of each school assessment team, the first priority was to identify school walking boundaries for each school. Based on input from the school representatives, Kathleen Easley preserved this information on aerial photographs that were provided to each school assessment team for evaluating walking conditions. The walking route maps only encompass those areas within the expected walking areas for each school, and each school will have their individual school walking route map.

School Assessment teams were asked to do the following:

- Identify preferred walking routes that would serve every residence with the school walking attendance boundary
- Identify barriers to walking within their attendance boundary that required further traffic engineering evaluation or assessment.

School teams were asked to provide copies of their aerial maps with notes and preferred walking routes to the Consultant by December 2011. During this process there were some minor revisions to some of the school walking attendance boundaries either to eliminate some walking areas because street crossings were too difficult for young students, or to match boundary areas for two adjacent schools that served the same population of students. For example, the western boundaries for Southside Elementary School and Heritage IGC were modified slightly to be consistent with each other. Similarly there were some minor walking attendance boundary adjustments to provide consistency in the north walking attendance boundaries for Coweta Junior High School and Mission IGC.

Based on this input and an assessment of aerial photographs, walking maps were developed for each of the following Coweta Schools:

1. Central Elementary School
2. Northwest Elementary School
3. Southside Elementary School
4. Heritage Intermediate Grade Center
5. Mission Intermediate Grade Center
6. Coweta Junior High School

It is important to note that for Northwest Elementary School, some of the area within the school walking attendance boundary is outside Coweta City limits. The portion of the walking attendance area inside and outside of Coweta is shown by various shading on the maps.

Existing traffic control (crosswalks and traffic signals) and crossing guard locations are shown on the maps. It is the intent to guide students to use existing traffic controls wherever possible. There was also an attempt to control or minimize the crossing of the railroad tracks for Mission IGC of the railroad to one location (Pecan Street), and in some cases additional crosswalk locations are recommended on the maps. The walking routes for the Junior high School students may cross the railroad tracks at two locations (Pecan Street and Chestnut Street). Central Elementary School students were not expected to cross Highway 51 or the BNSF railroad tracks that extends through the central Coweta.

Copies of the school walking route map for each school are shown on the following pages. The existence of a walking route shown along the street does not imply that it is

a “safe” or fully improved route. Safety requires appropriate actions and behavior by both the driver and pedestrian. However, it does mean that it is an optimal route based on existing conditions and input from the school assessment teams. Furthermore, the “safest route” is not always the shortest or most direct route, and may require pedestrians to be diverted to nearby streets or traffic control for street crossings.

The school routes for Southside Elementary School and Heritage Elementary School show a path for children through the church parking lot on the west side of Highway 72. This is highly acceptable since the peak hours for the church parking are not the same hours children are walking back and forth to school. It would be advantageous if a route is provided for students who cross the parking lot either with striping or through the use of orange cones that would be set and removed by the crossing guard or the school maintenance staff.

There are also walking path connections shown between Southside Elementary School and Heritage IGC. While these paths were not ranked in the sidewalk master plan, these segments are eligible for applying for SRTS Infrastructure funding as long as the Coweta School District provides the right of way and no additional land has to be purchased. Walkways are also shown on the walking maps for Coweta Junior High School and Mission IGC from Highway 51 south to the respective schools. These walking paths are also eligible for infrastructure funding if it is thought that these walking paths have the highest priority to encourage school walkability.

If conditions should change in the future, either through new development or additional sidewalk, there may be a need to revise the walking maps. They should be reviewed annually for possible changes.

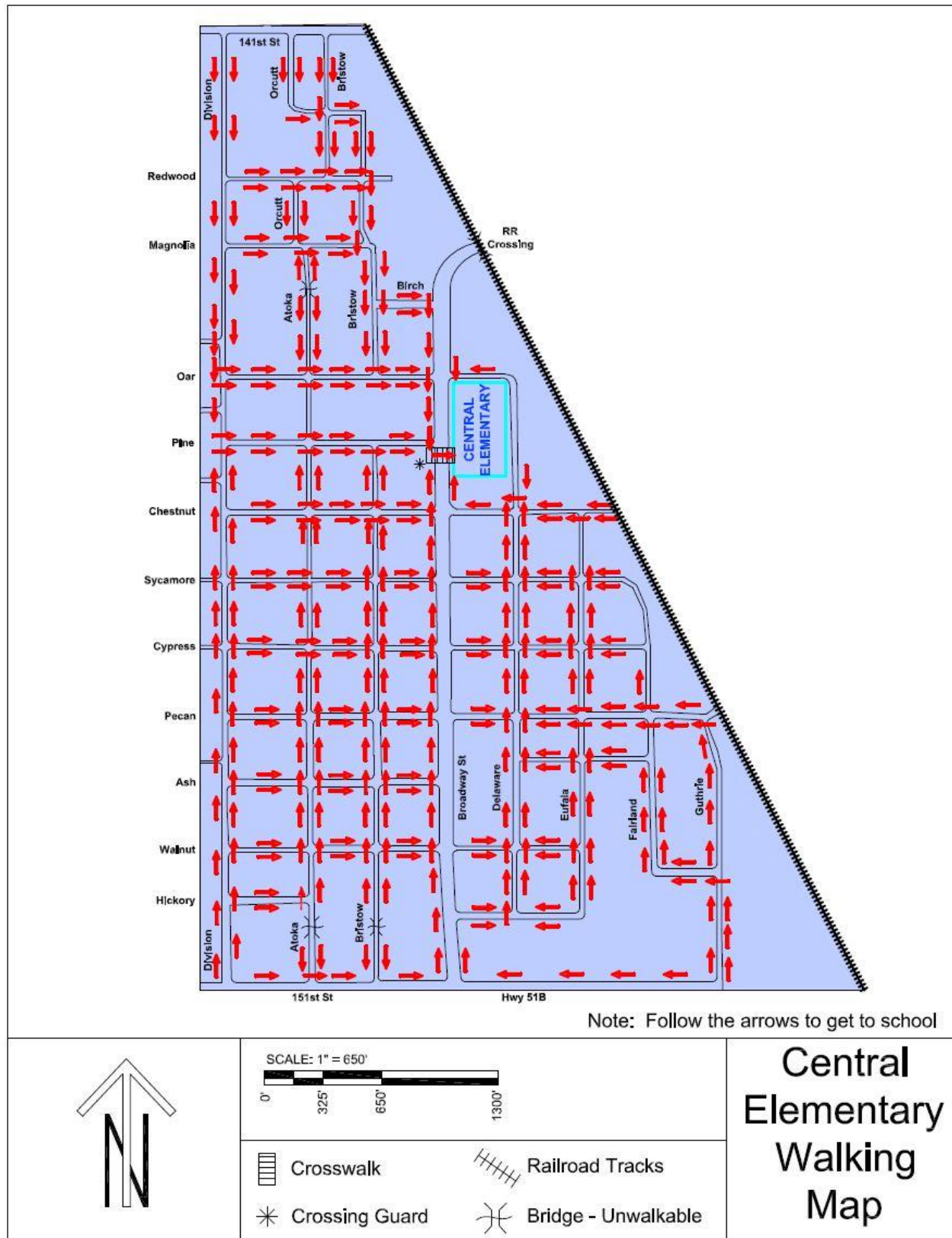
The school walking route maps should be provided to parents along with instruction on walking and bicycling safety, and parents should be encouraged to walk with their children to school whenever possible. Furthermore, children should be encouraged to walk in groups. Parents should discuss safe crossing practices and the routes to and from school before the first school walking or bike trip on their own.

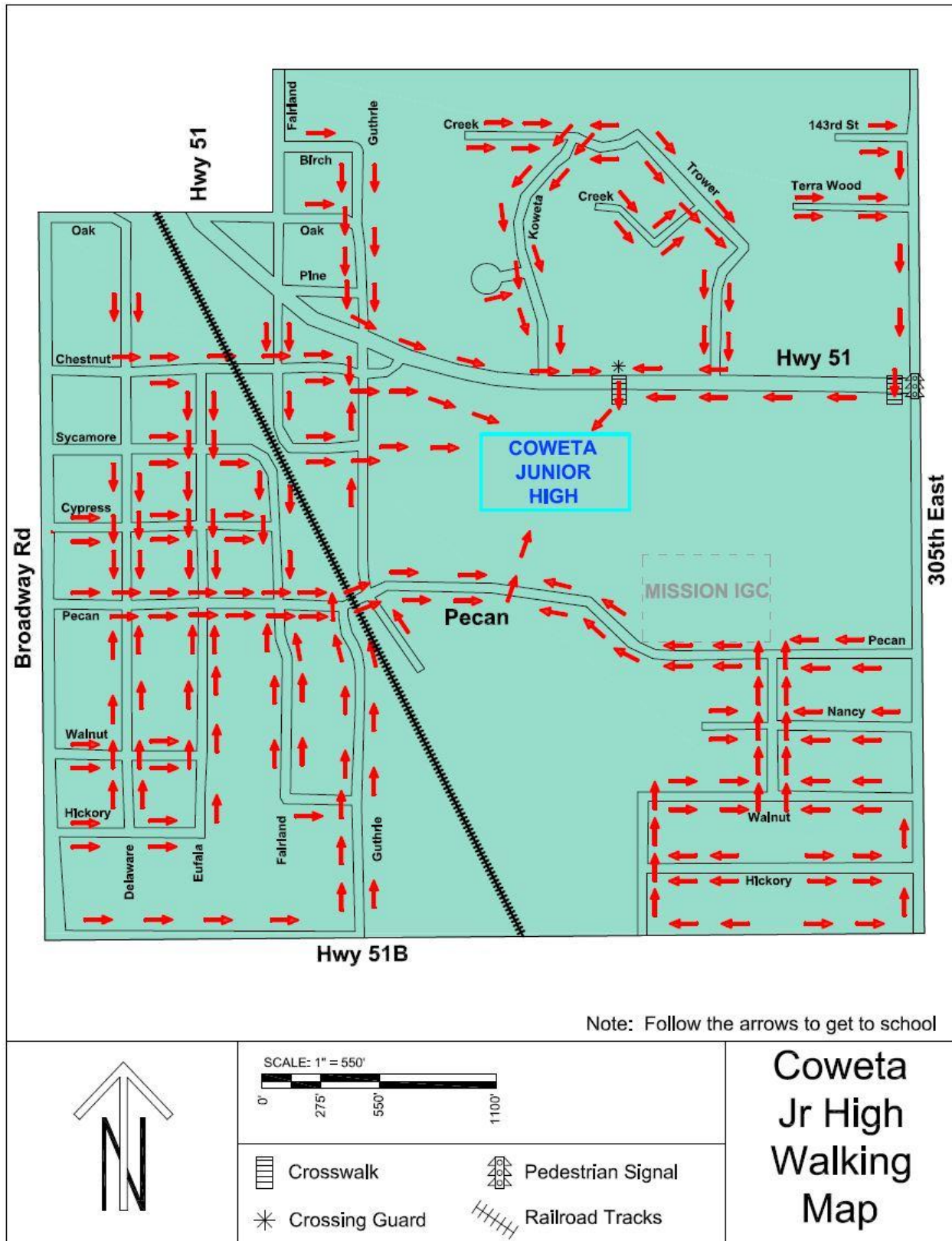
Safety tips from OSDH, NHTSA, and Safe Kids USA urge parents to keep safety in mind when walking near traffic and along roadways include³:

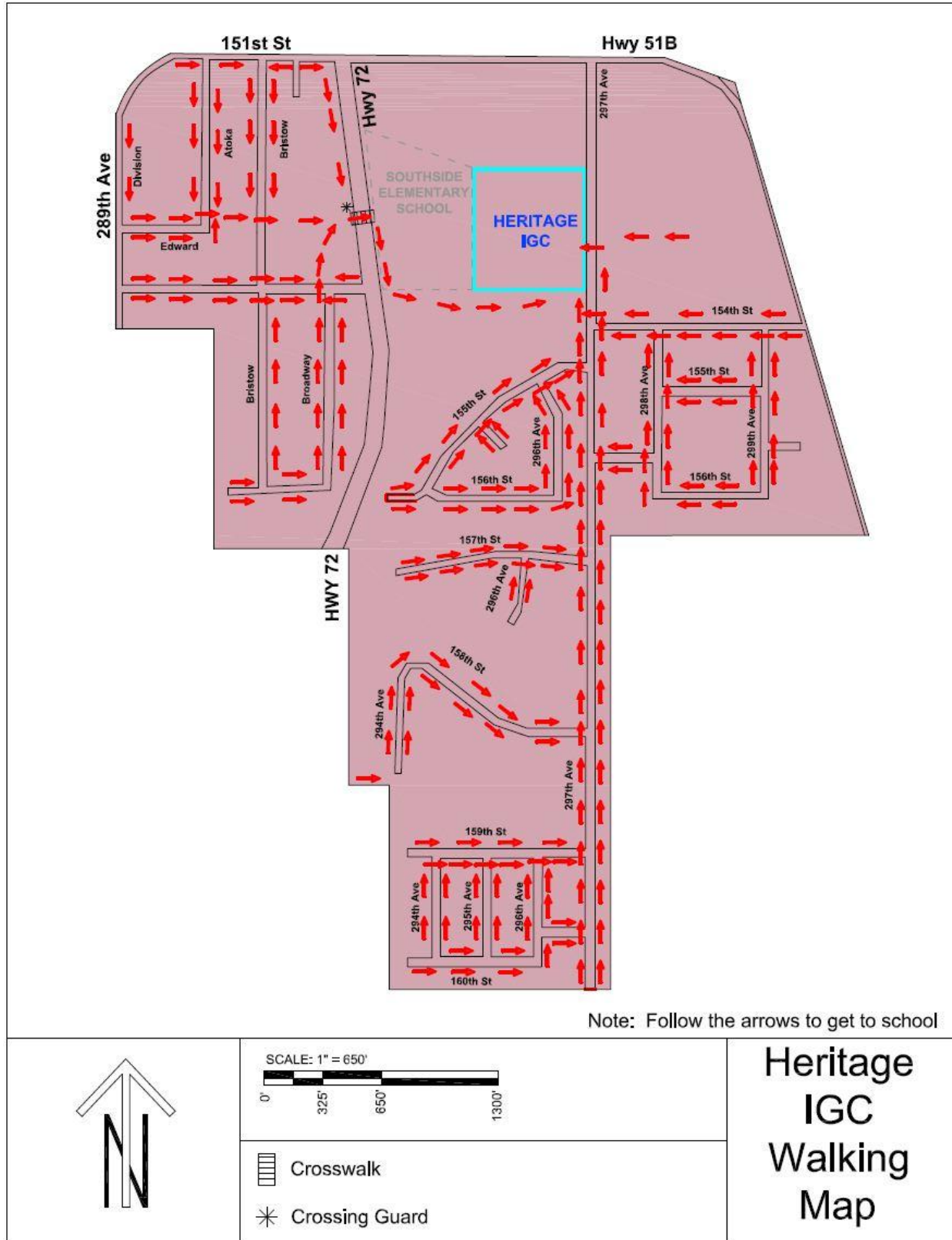
³ State Health Officials Offer Tips for Child Pedestrian Safety, Oklahoma State Department of Health, Communications Office, Pam Williams, April 8, 2010, accessed February 7, 2012 from http://www.ok.gov/health/Organization/Office_of_Communications/News_Releases/2010_News_Releases/State_Health_Officials_Offer_Tips_for_Child_Pedestrian_Safety.html

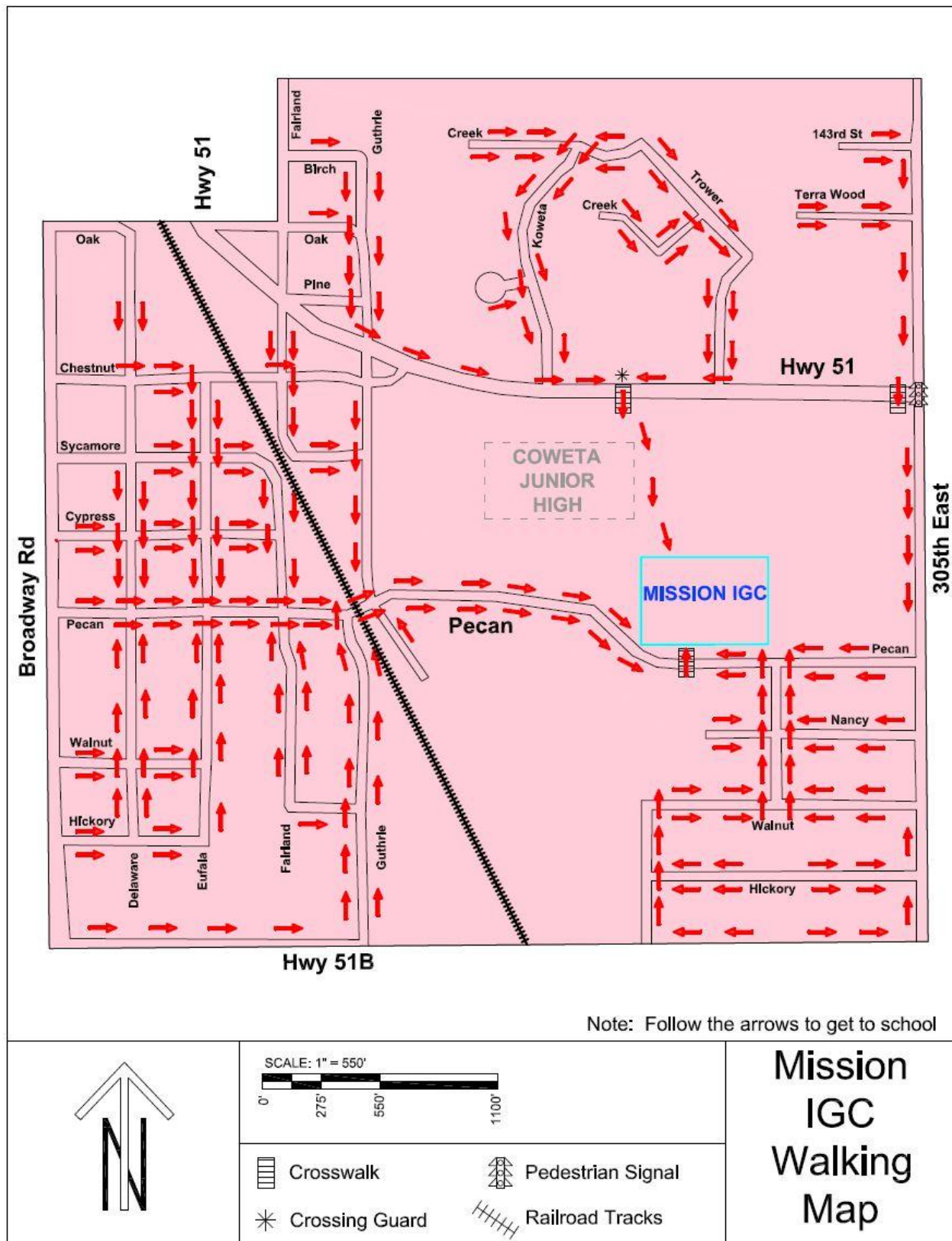
- **Walk on sidewalks, crosswalks, or walking paths.** Avoid walking in traffic where there are no sidewalks, crosswalks, or walking paths. If you must walk on a street without sidewalks, walk facing traffic.
- **Cross at intersections.** Most pedestrians are involved in traffic crashes when they do not cross the street at intersections.
- **Look left, right, left.** Stop at the curb and look to the left, to the right, and then to the left again for traffic. Pedestrians who stop at the curb signal to drivers that they intend to cross the street. Cross streets on marked crosswalks and obey traffic signals.
- **See and be seen.** Stay out of the driver's blind spot and make eye contact with drivers when crossing busy streets. Do not assume that drivers can see you. Wear bright colors or reflective clothing and carry a flashlight when walking in the dark. Be aware of vehicles backing out of driveways or parking spaces.
- **Supervise children near traffic.** Avoid letting children play alone in driveways, parking lots, or near traffic – children are small and are not easily seen by drivers, and children have difficulty judging vehicle distances and speeds. Teach children to obey traffic rules and cross the street with a trusted adult whenever possible.
- **Prevent backovers.** Teach children never to play in, under, or around vehicles. Carefully check driveways, streets, parking spaces, and other areas around your vehicle for children and adults before backing out.

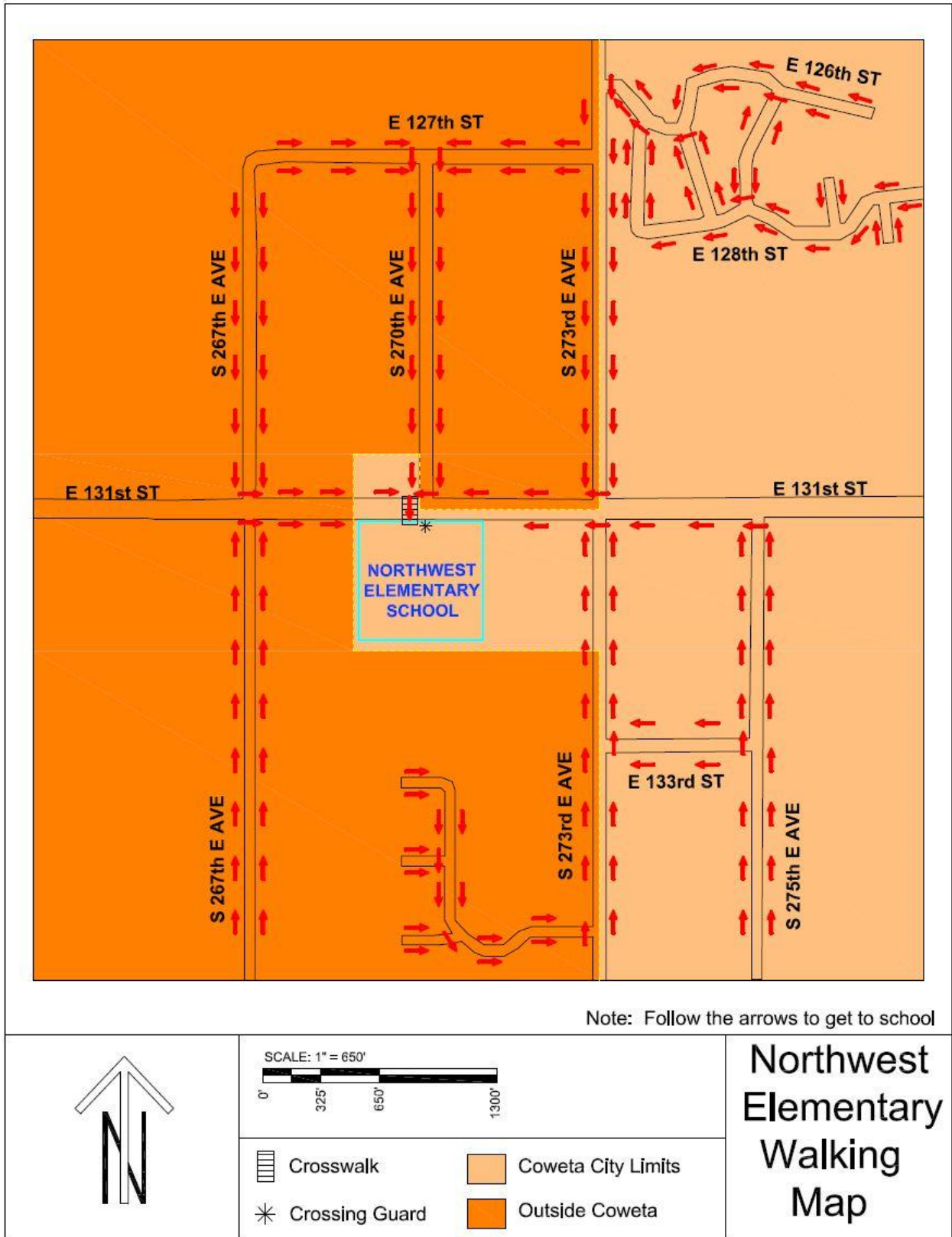
It is advisable to provide this or a similar type of safety information on the school websites where the walking route maps are displayed. If the school maps are printed, the safety tips should be provided on the back of the printed maps. Safety information and instructional methods should be age-appropriate for students.

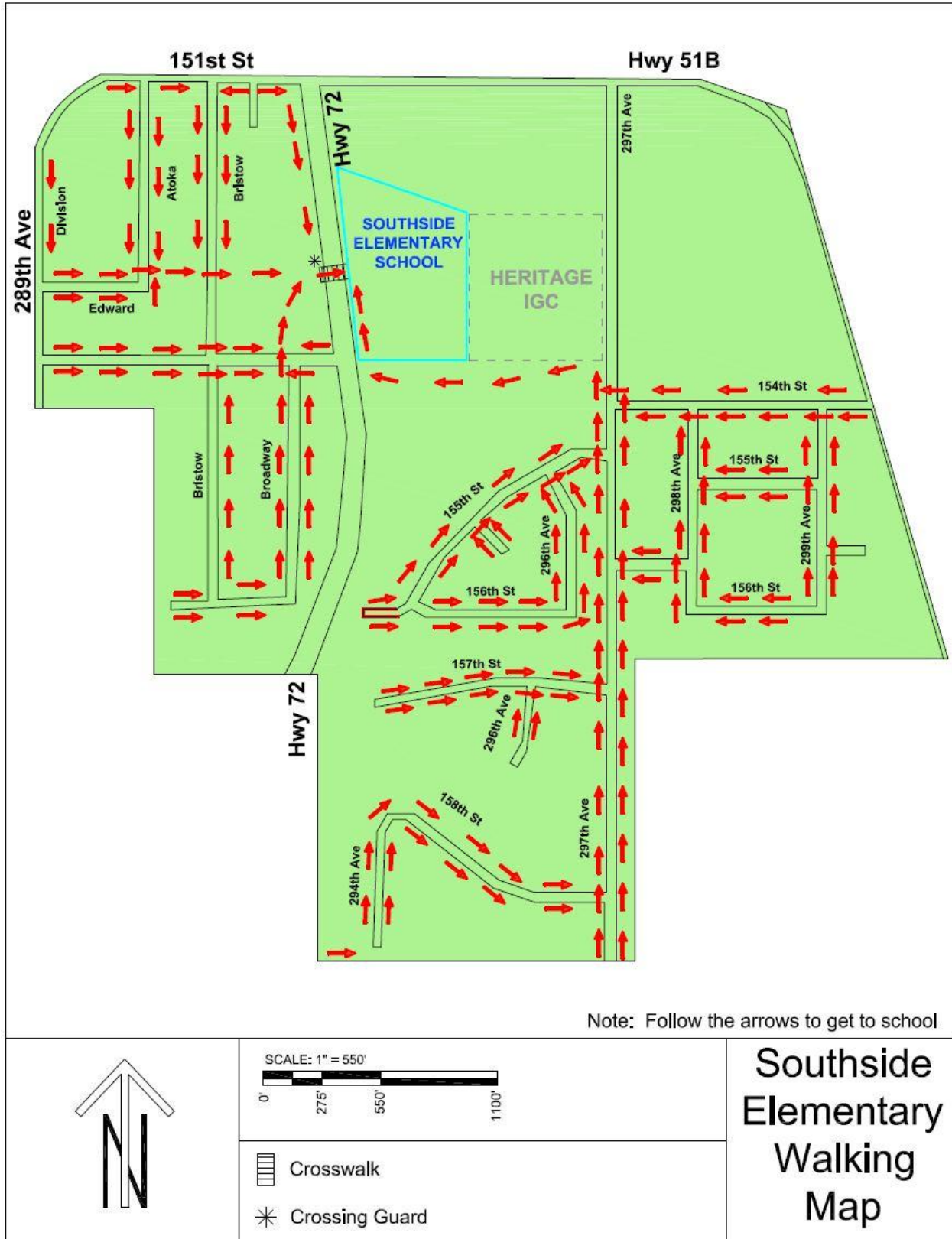












4. Criteria for Evaluating Sidewalk Segments

The Lee Engineering, LLC project representative attended the Sidewalk Master Plan kick-off meeting with City officials on October 5, 2011 at Coweta City Hall. Meeting minutes are attached as Appendix C. At that meeting a number of issues were discussed, and several decisions were finalized on how to complete this project and develop the Sidewalk Master Plan for the community.

a. Identification of study area and candidate sidewalk segments

To make the program manageable, there had to be a limit on the area studied. Only those areas within two miles of an elementary or junior high school (grades K - 8) are eligible to receive infrastructure improvement funding through the SRTS program. However, even that distance may be excessive for the Coweta Sidewalk Master Plan since two miles is outside of the typical walking area for most students in grades K – 8. Furthermore, there are so many sidewalk needs closer to the eligible schools that it is unlikely that street segments beyond one mile will ever be a candidate for SRTS sidewalk construction funding.

It was decided that only those segments within Coweta City Limits are candidates for ranking in the Master Plan. For those street segments where the City Limits runs down the centerline of the street (within the study area), only the portion or side of the street inside Coweta limits was considered as a potential sidewalk candidate, and length and cost for that street segment was revised accordingly.

Another decision was to exclude short cul-de-sacs or “stub” streets in the study as these should not pose a challenge to walking for the students living on those streets. Any streets judged as “private” were excluded from the study. None of the off-street paths or trails that were part of the School Walking Maps are assessed as a part of the Master Plan. It is conceivable, however, that walking paths providing a connection between Coweta Junior High School and Mission IGC, and from Heritage IGC to Southside Elementary School may be viable pathways for future SRTS Infrastructure project requests as long as the right of way is donated by the property owner (i.e. school district) for the sidewalk.

Street segments that had existing sidewalks on both sides of the street were not included in the study to rank candidates for sidewalks. An inventory of existing street segments with sidewalks within the study area is shown as Appendix D. Streets that had sidewalk along one side of the street were included in the evaluation, but the overall sidewalk length was modified to account for existing sidewalk portions and to properly calculate the planning level costs to provide the missing sidewalk segments. It is

understood that the existing sidewalks in some areas are old and in need of repair or modification to meet current ADA standards or to provide more width. Several of the existing sidewalk segments are narrower than typically desirable for groups of walking students. However, it was considered to be far more important to provide new sidewalks than to identify existing sidewalk segments that could be improved with upgrades.

A total of 206 street segments were evaluated and ranked in a study area that comprised 5.58 square miles (3,571 acres) within Coweta city limits. This represents 51.8 percent of total area within Coweta city limits (10.77 square miles). These 206 sidewalk segments comprised 89.7 linear miles of sidewalk needs, and about 48.3 roadway miles in Coweta.

b. Segment length

It was agreed at the kick-off meeting that each street segment would not be longer than one-half mile in length (except in rare instances). There was an attempt to make each segment somewhat uniform. Street segments may be shorter than a half-mile in length if conditions changed along the segment or if the segment crossed into another school attendance area. Furthermore, segments may be subdivided into shorter segments if they existed beyond $\frac{1}{4}$ or $\frac{1}{2}$ mile boundary from the closest school that the sidewalk serves.

c. Sidewalk ranking criteria

Nine criteria were used to evaluate each street segment within the study area. The following describes the ranking criteria and the point values or weighting assigned to each segment.

i. Proximity to School

Streets were ranked based on how close they were to the schools. If a street segment is closer to a school, more children would be expected to use the sidewalk along that street. The following weighting was used in the assessment:

- Adjacent to school = 10
- Within $\frac{1}{4}$ mile of school = 7
- $\frac{1}{4}$ to $\frac{1}{2}$ mile from school = 4
- $\frac{1}{2}$ mile to 1 mile from school = 1

Those street segments outside the one-mile study boundary of the six candidate schools were not included in the study. For those street segments that served multiple schools, the point assignment was based on the closest school within the walking attendance boundary area. There were some streets that were physically located

closer to Southside Elementary School, but were within the Central Elementary School walking attendance area. In those instances, the distance was measured from the Central Elementary School where children using the sidewalk were expected to walk.

ii. Number of schools the sidewalk will serve

Schools that serve multiple schools should have a higher priority for construction. Some sidewalk segments would serve up to three schools (grades K – 8). This should also mean that there would be a potential for serving a higher number of students. The weighting for this criterion is as follows:

3 Schools = 10

2 Schools = 5

1 School = 3

No Schools = 0

If a street segment was not within a school walking map area or if it was within the walking attendance area, but students were not routed on that street, it was classified as serving “no schools” and was not provided any points for this criterion.

iii. Pedestrian usage

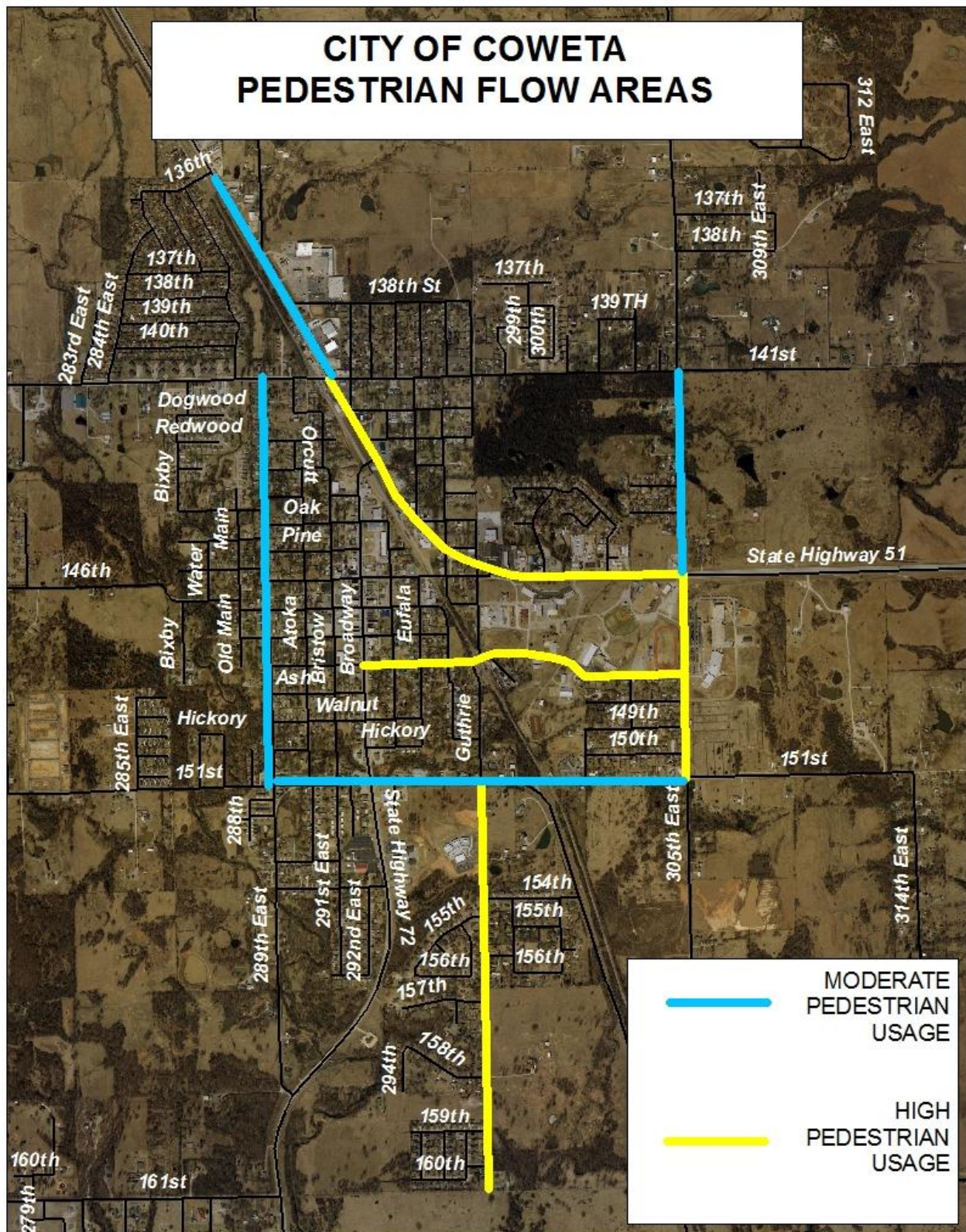
Streets that experience higher levels of walking should have a higher priority for sidewalk installation. It was not within the scope of this study to conduct multiple pedestrian counts to determine pedestrian volumes, and in most cases street corridors would not be at their full potential due to the lack of good walking routes along streets in most parts of Coweta. Instead, the city of Coweta was asked to provide a map (Figure 4-1) showing those street corridor’s with “High” and “Moderate” pedestrian usage. All other segments were considered “Low” pedestrian usage. The weighting for each category is:

High Pedestrian usage = 10

Moderate Pedestrian Usage = 5

Low Pedestrian Usage = 1

The majority of street segments were categorized of having relatively low pedestrian usage based on the information provided by the Coweta officials.



High pedestrian street corridors in Coweta

iv. Age of students

Streets that serve younger students (elementary age) are a higher priority for sidewalk installation compared to streets that serve older students (junior high school) who are more mature and more capable to safely walk along a street with motor vehicle traffic. For this criterion, when a street serves two or more schools, the age of the youngest students that uses the street is considered. The criterion was ranked as follows:

Elementary = 10
Intermediate = 8
Junior High = 5
No School served = 0

If a street segment was not on a school walking route map, it received no points for this criterion, even if the segment was physically within a mile from the school.

v. Serving other users

Streets that serve other pedestrian attractors should also have a higher priority for sidewalk construction compared to those that only serve single-family residential or industrial uses. Other pedestrian attractors included parks, churches, libraries, shopping centers/plazas, and Coweta High School (not currently defined within the SRTS funding legislation). The Lee Engineering team used information from aerial maps and personal knowledge of the area to identify pedestrian attractors along a street segment. If another pedestrian attractor was adjacent to the individual street segment, it was given an additional 5 points in weighting. Otherwise, no additional points were added.

vi. Availability of alternate walking routes

If there are no alternate street/sidewalk segments to use, an individual street segment should have a higher priority for sidewalk installation than segments where pedestrians can use a convenient alternate route. For those segments where no alternate routes existed, an additional 5 points of weighting were added. If there were alternate routes, no additional points were added. The evaluation of this criterion for each individual segment was a judgment call.

vii. Street classification

Those streets with higher traffic levels create more challenges for pedestrians, especially if no sidewalk exists to allow pedestrians to walk outside of the street surface.

It was originally thought that multiple classifications would be established based on traffic volume counts, however, few count data exists within the study area. Instead street classification was used as a surrogate. A map titled, Figure 5, from the Coweta Metropolitan Area Planning Commission Major Street and highway Plan, as adopted by Coweta City Council in January 1993 was used to identify street classification for the study segments. The weighting based on street classification was as follows:

Arterial = 10
Collector = 5
Local = 1

The study area consisted of 52 arterial segments, two collector segments and 152 local street segments. The “missing” sidewalk mileage for each street classification consisted of: Arterial street - 33.36 miles; Collector street - 1.07 miles; and local street - 55.27 miles.

viii. Pedestrian/Bicycle barriers

Some street/roadside features provide additional challenges to pedestrians and young bicyclists. These challenges, or barriers, may be in the form of no place to walk outside of the street, or may involve a railroad track crossing. While busy or arterial street crossings may also be considered a barrier, the segments were typically ended at an arterial street intersection, so an arterial street crossing is really not a barrier along that segment. If there was a pedestrian barrier along a street sidewalk, that segment was given a weight of an extra 5 points. Otherwise, no additional points were added.



Example pedestrian barrier existing at creek crossing

ix. Existing development along street segment

At the October 5, 2011 kickoff meeting, it was suggested that the percent development along a street should be a consideration as a part of the sidewalk ranking process. If the land along a street segment is currently undeveloped, it is probable that the land owners or developers will be obligated to build the “missing” sidewalk segments through zoning requirements for their off-site improvements. Any sidewalk built by the developers will save the community from having to build that “missing” sidewalk segment. The percent development along a street segment was estimated by reviewing the aerial maps for that segment using the most up-to-date maps, and scores of 0 to 10 were added to the weighting based on an estimation of the percent of developable land that existed along a segment.



A fully developed neighborhood built without sidewalks has no mechanism for sidewalk construction except through Improvement districts or SRTS funding. While an all-weather walking surface is highly preferred, many low volume, low speed local streets are walkable without paved sidewalks

d. Planning Level Costs

The cost to build a sidewalk is highly dependent on a number of factors, including the existing features/barriers along the right-of-way and the amount of engineering needed to bridge drainage ditches or creeks, accommodate steep side slopes or to relocate (or

avoid) utilities. At times, additional right-of-way dedication may be required to build the sidewalk or to accommodate utilities or other structures along the roadway.

Information was obtained from William Coors III, Coweta City Engineer for comparable sidewalk costs through the Oklahoma Department of Transportation. Comparable sidewalk projects could not be found for Wagner County from ODOT's website. Comparable construction costs in Tulsa County ranged from \$40.00 to \$70.00 a square yard from the summer of 2011. This compares to \$4.44 to \$7.77 per square foot. Furthermore a contractor in Coweta provided the following cost estimate to City officials: \$5 per square foot for new sidewalk and \$7 per square foot to tear out old sidewalk and replace with new sidewalk.

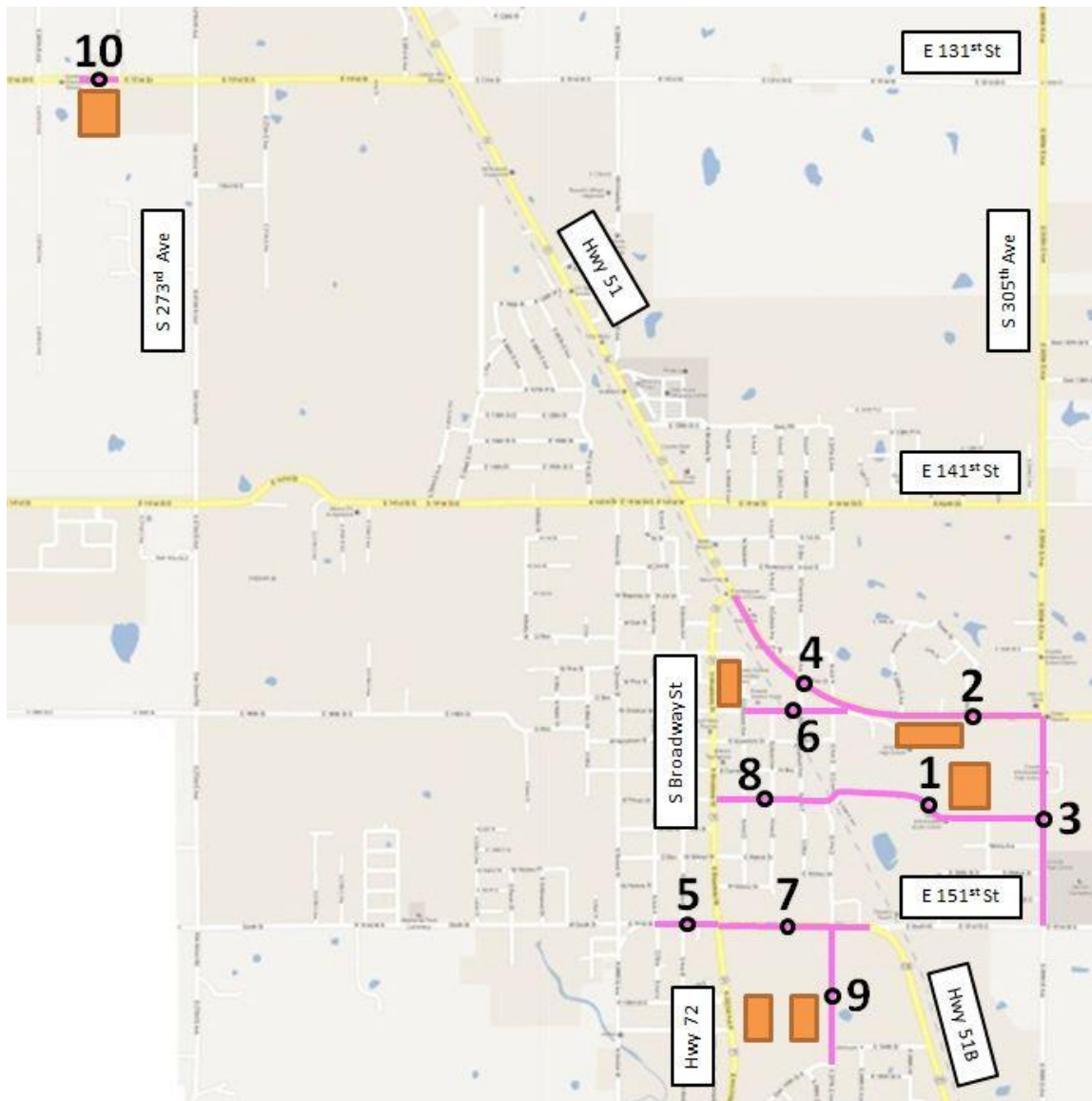
It was decided to use a number near the high end of the range; \$7 per square foot or about \$63 per square yard. Thus for a lineal foot of five (5) foot wide sidewalk, this would result in a planning level cost of \$35 per. For a six (6) foot wide sidewalk, this would result in a planning level cost of \$42 per linear foot.

These costs are for comparison purposes only and merely provide a rough estimate of the expected costs. The need for engineered designs and bridges for creeks and drainage structures or the need to relocate (or go around) utility structures would greatly affect those costs. They are to be used for comparison purposes only. Site specific assessments and costs estimates are needed prior to creating proposals for SRTS or other sidewalk projects. The costs do not include costs for pedestrian foot-bridges, retaining walls, railing or right-of way. The SRTS program does not allow the use of funds to purchase right of way or sidewalk easements. Any needed right of way or sidewalk easements must be obtained prior to submitting an application for a SRTS sidewalk infrastructure project to ODOT.

5. Results

All 206 roadway segments within the city of Coweta were ranked using the nine criteria listed in Section 4. The, and the results are shown in Appendix E on a priority basis (ranking from highest to lowest), and in Appendix F in an alphabetical listing by street segment. The ranking worksheet for each street segment, in priority order is listed as Appendix G (priority order and Appendix H (alphabetical listing). A discussion of each of the top ten ranked segments is provided below.

a. Highest Priority Sidewalk Segments



Overview of Highest Ranked Sidewalk Corridors and School Locations

1. **E Pecan St from S Fairland Avenue to S 305th Avenue** – This is a local street that is on the walking route maps for Mission IGC and Coweta Junior High School. It is also appears to be a high priority route to serve the Coweta Intermediate and High School and provides access to the fairgrounds. In addition to providing an important link between the aforementioned schools and the community west of the railroad tracks, the segment includes the railroad crossing, which is considered a pedestrian and bicycle barrier. This was also identified by Coweta City officials as a high pedestrian corridor. This is the only east west corridor south of Highway 51 to serve this area between Broadway Street and S 305th Avenue

The length for this roadway segment is 3,170 feet, with approximate sidewalk length needed of 6,020 feet. The planning level cost for providing sidewalk along this segment is \$210,700 assuming a sidewalk width of 5 feet.



Pecan Street looking west – East end



Pecan Street Looking west – Mid section



BNSF Railroad crossing on Pecan Street – West end

E Pecan St – S Fairland Ave to S 305th E Ave

#1



2. **Highway 51 from S 300th E Avenue to S 305th E Avenue** – This is a state highway that borders the north side of Coweta Junior High School and also is a walking route crossed by students attending Mission IGC and Coweta Intermediate and High Schools. There is a ladder marked crosswalk across Highway 51 centrally located in front of Coweta Junior High School that may be used by the junior high school students and Mission IGC students. This road was also identified as a high pedestrian corridor by City officials. The drainage ditches along Highway 51 make walking along portions of this roadway somewhat challenging.

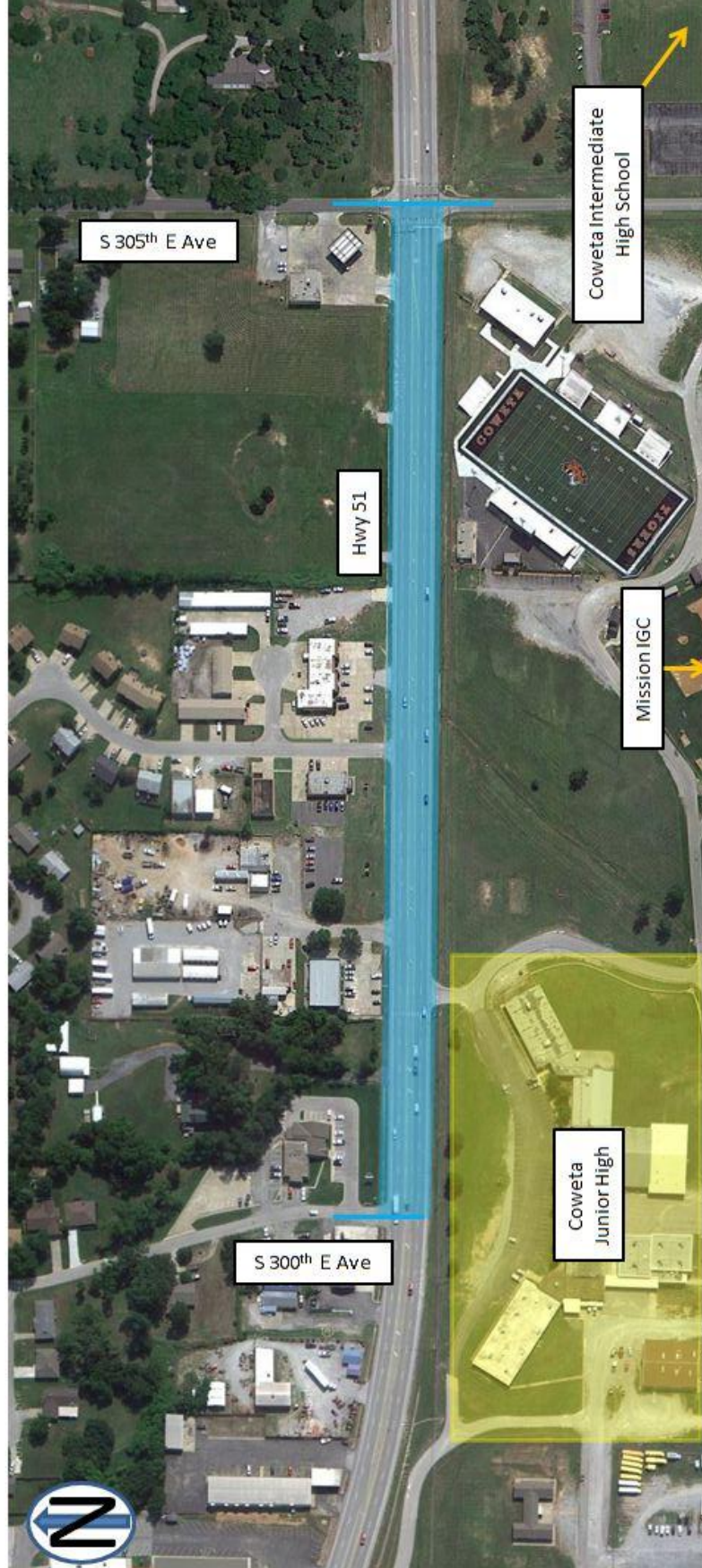
The length of this segment is 1770 feet, with 3,540 feet of sidewalk required along both sides of this segment at a planning level cost of \$148,680 to provide six (6) foot wide sidewalks along both sides of the street. However, some of the physical conditions along this street may make it more expensive to design and build. Another consideration is to evaluate an alternative crossing treatment at the crosswalk (in addition to the signs, ladder crosswalk and crossing guard) as well as a way to bridge the drainage ditch to make this crossing accessible to a person in a wheelchair.



Highway 51 looking west towards Coweta Junior High School

Hwy 51 – S 300th E Ave to S 305th E Ave

#2



3. **S 305th E Avenue from Highway 51 to E 151st Street S** – This segment is a vital connection from the state highway that provides pedestrian access for the Mission IGC students and some access for the Junior high School Students (as an alternate route to walking along Highway 51). This was identified as a “high pedestrian corridor” that is heavily used by the Coweta Intermediate and High School students. The intersection of Highway 51 and S 305th E Avenue is signal-controlled and the intersection contains the only pedestrian signal in Coweta city limits near the schools. S 305th E Avenue is also classified as an arterial street.

The segment length is 2,640 feet with a length of sidewalk needed totaling 5,280 feet. Thus, the segment planning level cost to add six foot wide sidewalks for this segment is \$221,760. Since this sidewalk is along the high school frontage on the east side of S 305th Avenue, and the football stadium and track on the west side of s 305th Avenue, consideration should be given to provide an 8 foot wide sidewalks along both sides of the street to accommodate the higher number of walkers.



305th Ave south of Highway 51 – looking south

S 305th E Ave – Hwy 51 to E 151st St S

#3



4. **Highway 51 from Broadway Street to S 300th E Avenue** - This state highway segment is not only an arterial street, but it is also a high pedestrian corridor that partially fronts Coweta Junior high School. It is used by students of both Mission IGC and Coweta Junior High School students, and there are other users of this sidewalk, likely including high school students as well as other businesses. The west end of this segment is at the Broadway traffic signal and the existence of sidewalk would allow the Oklahoma DOT officials to provide pedestrian signals across Highway 51 at this signal.

The street segment is 2740 feet, and the length of sidewalk would be 5480 feet, resulting in a planning level cost of \$230,160 for sidewalks along both sides of Highway 51. Costs for sidewalk installation along this highway may be higher due to the need to engineer around the drainage ditches along Highway 51.



Highway 51 looking east towards Coweta Junior High School

Hwy 51 – N Broadway St to S 300th E Ave

#4



5. **E 151st St S from S Atoka Avenue to N Broadway Street** – This is an arterial street segment that is on the boundary between the walking map for Central Elementary School and Southside elementary school and is also a boundary street for the IGC's. This corridor was also identified as a moderate pedestrian volume corridor.

The segment length is 800 feet with a need for 1600 feet of sidewalks, resulting in a planning level cost of \$67,200 to provide 6-foot wide sidewalks along both sides of this segment.



151st St east of Atoka – looking east

E 151st St S – S Atoka Ave to N Broadway St

#5



6. **E Chestnut Street from S Delaware Avenue to Highway 51** – This was the second highest ranked local street in the community and while it is on the walking route maps for both Central Elementary School, and Mission IGC, it provides some of the most direct connection for Coweta Junior High School students. The railroad also is a barrier to pedestrian travel along this corridor. The segment only extends west to Delaware Street because there is sidewalk for the block between Delaware Street and Broadway Street.

The segment length measures 1350 feet with a needed sidewalk length of 2000 feet. The planning level costs for a 5-foot wide sidewalk along both sides of the street is \$70,000.



E Chestnut St east of Delaware – looking east towards BNSF rail tracks

E Chestnut St – S Delaware Ave to Hwy 51

#6



7. **Highway 51B from Broadway Street to E 151st St at split** – This is an arterial street that borders the walking attendance boundaries for the Mission and Heritage IGC and is also the north boundary to the Southside Elementary School. It was identified as a moderate pedestrian walking corridor.

The segment length is 1930 feet, with 3860 feet of sidewalk needed along the segment. The planning level cost is calculated at \$162,120 to provide 6-foot wide sidewalks along both sides of this street.



Highway 51B east of Broadway St – looking east

Hwy 51B – N Broadway St to E 151st St at Split

#7



8. **Pecan Street from Broadway Street to S Fairland Avenue** – While this local street was ranked 8th overall, this is a continuation of the highest ranked segment and is on a high pedestrian corridor that serves as a walking path for Central Elementary School, Mission IGC and Coweta Junior High School, as well as serving Coweta Intermediate and High School students.

The segment length is 1080 feet, but since there is already sidewalk along the south side of Pecan Street, only 1080 feet of additional 5-foot wide sidewalk is needed, for a total segment planning level cost of \$37,800.



Pecan St east of Broadway St – looking east

E Pecan St – N Broadway St to S Fairland Ave

#8



9. **S 297th E Avenue from Highway 51B to E 154th Street** – This is a local street that runs along the east side of Heritage IGC and was classified as a “high pedestrian corridor”. Despite the existence of a relatively new school, no sidewalk exists along the school frontage (west side of S 297th Street). There is a pedestrian barrier at the south end of this segment in the form of a small canal crossing just north of E 154 Street. This canal will have to be bridged on at least one side of 154th St to provide a continuous path, and it would be best to do so along the west (school) side of 297th E Ave.

The total segment length is 1510 feet, but the length of the sidewalk that is missing is 3,020 feet, resulting in a total segment cost of \$105,700 for a 5-foot wide sidewalk, exclusive of a pedestrian crossing over the creek. If there is not sufficient funds to provide sidewalk along both sides of the street, the west side should be a priority.



West side of S 297th Ave looking south



This photo shows the creek crossing along the west side of S 297th St E Avenue immediately north of E 154th Street. These small creeks can be bridged for pedestrian and bicycle use at much lower cost than widening the entire roadway

S 297th E Ave – Hwy 51B to E 154th St

#9



10. **E 131st Street S from Approximately 269th E Avenue to 271st E Avenue** – This is a short segment along the north side of Northwest Elementary School and extends 410 feet west to the Coweta City Limits. This segment had the exact score as segment #11 which is the portion of E 131st S that is also along a portion of the north side of Northwest Elementary School and extends east to S 273rd E Avenue for a distance of 980 feet. 131st Street is classified as an arterial street, and while considered a low pedestrian corridor, it is adjacent to the front entrance to the school and is the most important part of the Norwest Elementary School walking plan.

The combined length of both segments of E 131st Street is 1390 feet with a combined length of 2,780 feet of sidewalk needed. The combined planning level cost for both segments of E 131st Street is \$116,760 for a 6-foot wide sidewalk.



E 131st Street looking west



E 131st Across from northwest Elementary School

E 131st St S – Approx. S 269th E Ave to S 271st E Ave

#10



b. Barrier Elimination

There are a number of rivers/creeks, drainage ditches and other barriers along the Coweta streets that make it challenging for pedestrians, especially children. One of the most notable challenges is to provide a way for pedestrians to walk along the road without having to invest a significant amount to widen the roadway. Regardless, this could add significantly more to a given sidewalk planning level cost estimate. Furthermore, these costs are highly site specific and may involve evaluation of engineering options to safely accommodating pedestrians and young children riding bicycle while providing for other uses of the right of way such as drainage.



Challenging 'barrier' locations for pedestrian travel in Coweta

One of the more significant walking barriers to Soutside Elementary School and Heritage IGC is the lack of a walkway on either side of S 297th E Avenue north of E 154th Street (left photo above). Instead of rebuilding the road to extend the culvert to cover the creek, it may be a better and far less expensive option to build a separate pedestrian bridge structure adjacent to the roadway along the west side of S 297th E Avenue to independently span the creek. Other challenging pedestrian locations may involve drainage facilities where little to no accommodation for pedestrian travel has been provided along the streets or at intersections (right photo above).



Example pedestrian bridge installation

The other notable barrier is the railroad track crossings that affect the walking routes for students attending Mission IGC and Coweta Junior High School. Intermediate and High School Students also have to cross the tracks. There are two railroad crossings that affect students walking paths, Pecan Street and Chestnut Street. Fortunately no elementary age students have to cross the railroad tracks, but even the IGC students are quite young to cross the railroad without adult supervision. The railroad tracks can present a “barrier” in a couple of ways, the walking surface crossing the tracks and the safety concern associated with a train approaching the tracks.

Sidewalk crossing surfaces at railroad crossings can be provided to make the crossing ADA compliant and provide a pedestrian path out of the roadway across the tracks. Coordinating road and sidewalk projects with railroads can be a long and expensive process.

The other issue with train activity can be addressed through warning signs, flashers and possibly gates at the sidewalk crossings, an adult crossing guard posted at the school or through a walking school bus that would provide adult supervision to all of the students crossing the railroad tracks. The Federal Railroad Administration publication, *Compilation of Pedestrian Safety Devices used at Railroad Crossings* is a good document to investigate various devices used for pedestrians.⁴ It is also advisable to

⁴ *Compilation of Pedestrian Safety Devices Used at Railroad Crossings*, Federal Railroad Administration, Office of Safety, January 2008, Accessed on February 9, 2012 at the following website:
http://www.fra.dot.gov/downloads/safety/Jan08_Ped_Devices_at_GX2.pdf

provide students education about railroad crossing safety for both pedestrians and bicyclists. This can be done in the form of classroom education, assemblies, and information on the school websites where students have to cross the railroad tracks.

Information from the National Center for Safe Routes to School⁵, provides the following guidance:

In keeping with NHTSA and other federal guidelines, the National Center does not advise students to avoid crossing railroad tracks, but recommends that if such crossing needs arise, that to the greatest extent possible, the following conditions be met: (1) appropriate at-grade crossings are implemented in accordance with relevant federal, state, and local guidelines; (2) appropriate supplemental safety devices (e.g., pedestrian signals, pavement markings) be incorporated into the project; and (3) that children be accompanied by a responsible adult and use extreme precaution when traversing such areas.

The School Walking Maps for Central Elementary School uses the railroad tracks as the east boundary for their walking area. Mission IGC students are only directed to cross the tracks at Pecan Street. Coweta Junior High School Walking maps show crossings along Chestnut and at Pecan Street.

Some appropriate child pedestrian safety materials for railroad track crossings can be found with materials prepared from Operation Lifesaver. Information prepared for parents included the following safety tips for parents to share with their children⁶:

- *Always cross at a railway crossing. A crossing has a sign or gates. Just like crossing the street – stop and look both ways before crossing train tracks.*
- *Listen for warning bells and watch for the flashing lights.*
- *Do not count on hearing a whistle to warn that a train is coming.*
- *If a train is going by, stand about 10 giant steps back from the tracks.*
- *Never try to cross the tracks if a train is coming. It is too dangerous.*
- *If one train goes by, look both ways again before crossing. Make sure another train is not coming from the same or another direction.*
- *Always walk your bike across the tracks to make sure your tires don't get caught.*
- *Take off your headphones when you are near railway tracks.*

⁵ <http://www.saferoutesinfo.org/program-tools/it-safelegal-elementary-school-children-walk-school-when-they-need-cross-railroad-trac>, Accessed on February 9, 2012.

⁶ Operation Lifesaver supports the initiatives of our partners and Stakeholders, Operation Lifesaver Canada October 20, 2008. Accessed from the following website:
<http://www.operationlifesaver.ca/general/2008/10/20/operation-lifesaver-supports-the-safety-initiatives-of-our-partners-and-stakeholders/>

c. Funding Options

Funding for building sidewalks should first be pursued from future developments or land owners in the area through zoning requirements at the time of development. If a subdivision builds a new neighborhood, the developer should be required to build the sidewalks and other off-site improvements for the arterial streets bordering the neighborhood development as well as along the internal subdivision streets.

Another way for sidewalks to be built is through the Improvement district process where property owners tax themselves for the street improvement with the city fronting the funding through a bond. The funds are to be collected back from the property owners over a period of 10 to 15 years. This process requires a petition process verifying approval of a majority of the property owners and proportional cost allocation. This is not the most popular funding mechanism amongst residents for neighborhood sidewalks.

The best place to start for future sidewalk funding would be the Safe Routes to School Program (SRTS) through the Oklahoma Department of transportation at the ODOT website: <http://www.okladot.state.ok.us/srts/index.php>. Applications for the next call for projects can be found at: <http://www.okladot.state.ok.us/srts/applications.htm>.

Other possible funding sources that should be explored include:

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU): <http://www.walkinginfo.org/funding/history.cfm>

Congestion Mitigation and Air Quality (CMAQ):
http://www.fhwa.dot.gov/environment/air_quality/cmaq/

Transportation Enhancements (TE): www.enhancements.org

Federal Transit Administration New Starts and New Freedom grants:
http://www.fta.dot.gov/laws/circulars/leg_reg_6624.html

Communities Putting Prevention to Work:
<http://www.hhs.gov/recovery/programs/cdc/chronicdisease.html>

Highway Safety Improvement Program (HSIP): <http://safety.fhwa.dot.gov/hsip>

Oklahoma Transportation Enhancement:

http://www.okladot.state.ok.us/projmgmt/enhance_prog/index.htm

Each of these funding sources has specific requirements that need to be addressed prior to application, some related to a documented safety problem, and some may have to be justified to show the project will reduce congestion and improve air quality. However, any project that eliminates a multitude of cars at a school and instead encourages walking and bicycling will help achieve those goals. All of the funding options require an application process and competitive bidding, through ODOT.

6. Evaluation of Coweta Sidewalk Ordinances

Lee Engineering offered to review the zoning ordinances related to sidewalks in the community. The ordinances related to the design, construction and maintenance of sidewalks were provided to the Lee Engineering project team for review. Suggested revisions are in red and italics for consideration for revision. While a vast majority of the ordinances are very good, there needs to be a way to provide more sidewalks in conjunction with developer off-site improvements, especially for churches and schools and other pedestrian generators that will result in higher levels of walking.

Sidewalk maintenance requirements:

SECTION 14-110 OWNER OR OCCUPANT NOT TO PERMIT SIDEWALK OR SIDEWALK AREA TO BECOME A HAZARD.

It is unlawful for the owner or occupant of property abutting upon a sidewalk area to permit the sidewalk or sidewalk area adjacent to the property to become a hazard to persons using the sidewalk, or sidewalk area.

SECTION 14-111 STREET NOT TO BE OBSTRUCTED SO AS TO INTERFERE WITH DRAINAGE.

It is unlawful for any person, firm, or corporation to obstruct any street, sidewalk, or alley, by placing any approach driveway or other obstruction or substance whatever that will obstruct or prevent the natural flow of water, into the storm sewers or drains, or dam the same so as to back any water upon the streets, alleys, sidewalks, or gutter.

SECTION 14-112 DUTY TO KEEP SIDEWALK AND GUTTER CLEAN. GOOD REPAIR.

It is the duty of the occupant of any lot or piece of ground abutting upon any street where there is a sidewalk or gutter on the street to keep such sidewalk or gutter clean and to remove therefrom all materials, snow or ice, trash, weeds, refuse, rubbish or hazards of any kind and to keep the sidewalk and gutter in good repair. If there is no such occupant of any such lot other than the owner, it is the duty of the owner to do the same.

4.16 SIDEWALKS:

4.16.1 Sidewalk Design Criteria:

A. Sidewalks shall be required on both sides of local and collector streets serving a residential subdivision, *a commercial or business area, industrial parks and all other land uses*, except where zoned Agricultural *or where pedestrian traffic is to be prohibited as designated by the City of Coweta or State of Oklahoma.*

B. All sidewalks shall be Portland Cement Concrete. Sidewalks shall include pedestrian bridges across creeks and streams where applicable.

C. The finished thickness of Portland Cement Concrete sidewalks shall not be less than four (4) inches and the width shall not be less than four (4) feet.

D. *In general, sidewalks should be constructed to a minimum clear width of five (5) feet along collector and local streets and a minimum clear width of six (6) feet along arterial streets except as approved by the City.*

~~D~~E. In general, sidewalks shall be constructed within the dedicated right of way at a distance no less than one foot from the abutting property lines and a green belt of no less than 2 feet between the street pavement and the sidewalk, and except at intersections or as approved by the City, shall be no less than three (3) feet from the outside curb line of the *local or collector* street pavement. *There shall be a green belt of no less than four (4) feet between the street pavement and the sidewalk, except at intersections or as approved by the City, shall be no less than five (5) feet from the outside curb line of the arterial street pavement.*

~~E~~F. Sidewalks must provide personal access for safe and convenient movement across curbs of physically handicapped persons, including those persons in wheelchairs. All sidewalks must conform to the Americans with Disabilities Act (ADA) requirements.

~~F~~G. Sidewalks shall be built so that no obstructions block the safe and convenient movement of residents and to facilitate pedestrian access to schools, parks, playgrounds, churches, shopping centers and etc. *A continuous connection shall be provided to adjacent sidewalk segments*

4.16.2 Concrete Base Preparation:

A. When constructing sidewalks, the concrete shall be laid on a firm compacted smooth surface at an average depth below finish grade equal to the thickness of the sidewalk.

B. All soft and yielding or other unsuitable materials shall be removed and replaced with suitable material before construction of the sidewalk.

4.16.3 Finish and Joints:

A. Sidewalks shall have a non-slip broomed surface.

B. Expansion Joints shall be placed at all intersections with curbs and not more than 30 feet apart.

- C. Transverse cracking joints will normally be tooled or sawed into the finished sidewalk to a depth of one (1) inch.
- D. Transverse cracking joints shall be placed at intervals not to exceed every 6 feet.

In addition to the ordinances listed above, City officials should explore a mechanism for the Coweta officials to take corrective action if the resident or property owner does not clear an obstruction from the sidewalk or repair a damaged sidewalk along their property in a timely manner. In some cases the lack of a response may be the result of a vacant property that is owned by a bank or other entity in another state. This provision needs to be reasonable and provide the property owner suitable time for notice, and there needs to be a mechanism within Coweta city government to identify the sidewalk problem (obstruction or damage) and adequately respond to the issue in a timely manner.